

**Memorandum of Understanding
on Japan - India Cooperation
for the Project on Efficiency and Environmental Improvement
of Coal fired Power Stations**

1. Background

On the occasion of the fourth ministerial-level meeting of the Energy Dialogue between India represented by H.E. Shri Montek Singh Ahluwalia, Deputy Chairman of the Planning Commission of India and Japan represented by H.E. Mr. Masayuki Naoshima, Minister of Economy, Trade and Industry of Japan on 30th April 2010, Japan and India decided on the implementation of a pre-primary study for efficiency and environmental improvement of coal fired power stations by dispatching experts and providing advice regarding modifications, and a memorandum of understanding of the study (hereinafter referred to as "the Pre-primary Study") was signed between the Japan Coal Energy Center (hereinafter referred to as "JCOAL") and India's Central Electricity Authority (hereinafter referred to as "CEA") for the Pre-primary Study.

India on its own has been implementing the National Program for Renovation and Modernisation (hereinafter referred to as "R&M") of existing thermal power stations, which is aimed at efficiency improvement through life extension and/or capacity upgradation, etc. The cooperation under the MOU on the Pre-primary Study aimed at sharing of technical expertise as well as in actual implementation of mutually agreed techno-economical R&M solutions was highly anticipated.

CEA and JCOAL selected three power stations that well suit the framework of cooperation of the MOU on the Pre-primary Study that pursues R&M with high efficiency, and have jointly achieved identification of the measures to overcome the barriers to the implementation of full-fledged diagnosis and the facilitation of R&M.

Both CEA and JCOAL are well aware that upon deliberation of each implementation plan of individual R&M project in terms of funding that is anticipated after the full-fledged diagnosis aiming at efficiency and environmental improvement through R&M of coal fired power stations, the existing financial instruments and/or other available bilateral financial schemes shall be examined as financing options.

Furthermore, possibilities for acquisition of Carbon Credits with bilateral/multilateral offset schemes that are anticipated to be materialized in the future will be examined upon consideration of financial side of a R&M project.

2. Accordingly, this Memorandum of Understanding (hereinafter referred to as MOU), made and entered into 11th day of June 2012 by and between :
- (i) Japan Coal Energy Center, the only institution in Japan which plays a major role through upstream to downstream of the coal chain organized and existing under the laws of Japan and under the jurisdiction of the Ministry of Economy, Trade and Industry of Japan, and having its principal office at 3F Daiwa Nishishimbashi Building, 3-2-1 Nishishimbashi, Minato-ku, Tokyo 105-0003 Japan (hereinafter referred to as "JCOAL"), and
 - (ii) Central Electricity Authority, a full-time body under the Ministry of Power (hereinafter referred to as "MOP"), which has the responsibility among others of formulating the National Electricity Plan in accordance with the National Electricity Policy and remains the main technical as well as policy advisor of the Central Government organized and existing under the laws of India, and having its principal office at Sewa Bhawan, R.K.Puram, New Delhi -110066 (hereinafter referred to as "CEA").

WITNESSETH:

Whereas, CEA and JCOAL (hereinafter referred to as "the parties"), intend to facilitate efficiency and environmental improvement of coal fired power stations in India by implementing the Project on Efficiency and Environmental Improvement of Coal fired Power Stations (hereinafter referred to as "the Project").

Now, therefore, in consideration of the mutual agreements contained herein, the parties have reached the following understanding :



3. Purpose

The purpose of this MOU is to carry out necessary full-fledged diagnostic activities and facilitation of measures against barriers to promote R&M that have been identified through the preceding Pre-primary Study of Efficiency and Environmental Improvement of Coal fired Power Stations toward Energy Efficient Renovation & Modernisation

4. Activities

- a. Implementation of full-fledged diagnosis based on the result of pre-diagnosis with priorities on, but not limited to the target power stations under the Pre-primary Study.
- b. Identification of issues to be addressed regarding the existing facilities, operation and maintenance and measures to be taken based on the result of the aforementioned full-fledged diagnosis.
- c. Update on the current and future policy trend of R&M in India and consideration of the identified barriers of R&M to find out those which could be overcome through mutual collaboration by CEA and JCOAL.
- d. Deliberation of justifiability and feasibility of individual R&M project that will be identified through the above a., b. and c. both in terms of technology and finance.
- e. Consideration of justifiability and feasibility of individual R&M project in terms of funding from the existing financial instruments and/or other available bilateral financial schemes.
- f. Consideration of possibilities for acquisition of carbon credits with bilateral/multilateral offset schemes that are anticipated to be materialized in the future upon consideration of financial side of individual R&M project.
- g. Consideration of training programmes that is deemed to be required upon

consideration of technological side of individual R&M project.

- h. Hold an annual joint meeting attended by representatives of the parties to discuss issues that have arisen or may arise in the course of implementation of the Project, in order to enhance the effect of the Project. Any relevant party/stakeholder may also attend the meeting as special invitees as agreed on by the parties.

The work sharing of the parties is as listed in Table 1 of Appendix 1.

Japanese side and Indian side bear respective expert cost in this MOU, while any cost for a training in Japan including the traveling expense between Delhi and Narita, if incurred, will be borne by JCOAL.

5. Duration

This MOU shall come into effect on the date of its signing and shall remain effective for a period of one (1) year and shall be automatically extended for successive period of one (1) year each up to a total period of three (3) years maximum, unless either party shall have otherwise notified to the other Party in writing at least three (3) months prior to the expiry of this MOU or any extension thereof.

6. Amendment

This MOU may be modified only in writing signed by authorized representatives of the parties.



In witness of this MOU, the parties have executed this MOU on this 11th day of June 2012 at New Delhi in two originals in the English language.



Mr. Toru Namiki
President
Japan Coal Energy Center (JCOAL)



Mr. A.S. Bakshi
Chairperson
Central Electricity Authority (CEA)

Table 1 The Work Sharing between CEA and JCOAL

| Items | CEA | JCOAL |
|---|------------------|------------------|
| a. Implementation of full-fledged diagnosis based on the result of pre-diagnosis with priorities on, but not limited to the target power stations under the Pre-primary Study. <ul style="list-style-type: none"> • Draft a long list of candidate units/TPS –ten (10) in total-, based on which a short list of the final candidate units/TPS –three (3) in total; out of which two (2) state-owned and one (1) NTPC-owned-shall be determined. • Draft and deliver a questionnaire to the final candidate units/TPS. • Conduct full-fledged diagnosis at the final candidate units/TPS. | X X X | X X X |
| b. Identification of issues to be addressed regarding the existing facilities, operation and maintenance and measures to be taken based on the result of the aforementioned full-fledged diagnosis. <ul style="list-style-type: none"> • Review and report of the result of the full-fledged diagnosis. • Identify issues to be addressed. • Introduce to CEA Japanese technologies that could be of reference to CEA in facilitating R&M in India. • Suggest and introduce to JCOAL power stations that could be a recipient of such Japanese technologies, based on the experience of the Pre-primary Study. • Propose measures to be taken for improvement. | X X X X | X X X X |
| c. Update on the current and future policy trend of R&M in India and consideration of the identified barriers of R&M to find out those which could be overcome through mutual collaboration by CEA and JCOAL. <ul style="list-style-type: none"> • Update on the current and future policy trend of R&M in India. • Consider the identified barriers of R&M to find out those which could be overcome through mutual collaboration by the both parties. | X X | X X |
| d. Deliberation of justifiability and feasibility of individual R&M project that will be identified through the above a., b. and c. both in terms of technology and finance. <ul style="list-style-type: none"> • Deliberation of justifiability and feasibility of individual R&M project in terms of finance • Deliberation of justifiability and feasibility of individual R&M project in terms of technology. | X X | X X |
| e. Consideration of justifiability and feasibility of individual R&M project in terms of funding from the existing financial instruments and/or other available bilateral financial schemes. <ul style="list-style-type: none"> • Provide with information about available bilateral/multilateral financing schemes. • Identify applicable schemes and measures to be taken. | X | X X |

| | | |
|---|---------------------|---------------------|
| <p>f. Consideration of possibilities for acquisition of Carbon Credits with bilateral/multilateral offset schemes that are anticipated to be materialized in the future upon consideration of financial side of individual R&M project.</p> <ul style="list-style-type: none"> • Provide with bilateral/multilateral offset schemes that are anticipated to be materialized and applicable in the future • Identify applicable schemes and measures to be taken. | <p>X X</p> | <p>X X</p> |
| <p>g. Consideration of training programmes that is deemed to be required upon consideration of technological side of individual R&M project.</p> <ul style="list-style-type: none"> • Confirm the necessity of training and identification of an envisaged training programme • Provide with information on relevant available programmes. | <p>X</p> | <p>X X</p> |
| <p>h. Hold an annual joint meeting attended by representatives of the parties to discuss issues that have arisen or may arise in the course of implementation of the Project, in order to enhance the effect of the Project. Any relevant party/stakeholder may also attend the meeting as special invitees as agreed on by the parties.</p> <ul style="list-style-type: none"> • Determine agenda, venue, attendance, etc. of the annual joint meeting • Review and share the result of the discussion by the annual joint meeting | <p>X X</p> | <p>X X</p> |

Mr. J.